

ATTORNEY DOCKET NO.: 041501-5477

Serial No. 10/062,716

Page 2

IN THE CLAIMS:

Claim 1 (Currently Amended): A method for forming a dual damascene line structure, comprising the steps of:

forming an inter-metal dielectric including a first region and a second region on a semiconductor substrate;

forming a first hard mask material layer on an entire surface of the inter-metal dielectric;

removing the first hard mask material layer on the first region to expose the inter-metal dielectric;

forming a second hard mask material layer on the exposed ~~an entire surface of the~~ inter-metal dielectric with a metallic material identical to that of the first hard mask material layer, wherein the second hard mask material layer is deposited on an inner sidewall in the shape of a spacer within the first region of the first hard mask material layer to form a curved surface;

forming a mask ~~to remove~~ by removing a portion of the first and second hard mask material layer on the second region;

etching the inter-metal dielectric of the first region to a first thickness using the inner profile of the mask to form a via hole having a positive slope of the mask;

exposing the inter-metal dielectric of the second region; and

ATTORNEY DOCKET NO.: 041501-5477

Serial No. 10/062,716

Page 3

etching the exposed inter-metal dielectric to ~~simultaneously form a via hole~~
~~having a positive slope by using an inner profile of the mask and~~ a trench having the via
hole.

Claim 2 (Canceled).

Claim 3 (Canceled).

Claim 4 (Canceled).

Claim 5 (Currently Amended): A method for forming a dual damascene line structure,
comprising the steps of:

sequentially forming a diffusion barrier film, an inter-metal dielectric including a
first region and a second region, and a first hard mask material layer on a semiconductor
substrate having a lower metallic line formed within an insulating layer;

selectively removing the first hard mask material layer on the first region using a
photoresist pattern to expose the inter-metal dielectric;

ATTORNEY DOCKET NO.: 041501-5477

Serial No. 10/062,716

Page 4

depositing a second hard mask material layer on an entire surface of the inter-metal dielectric with a metallic material identical to that of the first hard mask material layer, wherein the second hard mask material layer is deposited on an inner sidewall in the shape of a spacer within the first region of the first hard mask material layer to form a curved surface;

removing a portion of the first and second hard mask material layer on the second region to form a mask having a double pattern;

etching the inter-metal dielectric of the first region to a first thickness using the inner profile of the mask to form a via hole having a positive slope of the mask;

removing the mask on the second region; and

etching the inter-metal dielectric to ~~simultaneously form a via hole having a positive slope by using an inner profile of the mask and~~ a trench having the via hole.

Claim 6 (Original): The method according to claim 5, wherein the inter-metal dielectric is formed of a low inter-metal dielectric material.

Claim 7 (Currently Amended): The method according to claim 5, wherein the ~~hard~~ mask is formed of one of Ti, TiN, Ta, TaN, and W.

Claim 8 (Canceled).

ATTORNEY DOCKET NO.: 041501-5477

Serial No. 10/062,716

Page 5

Claim 9 (Canceled).

Claim 10 (Currently Amended): The method according to claim 5, wherein the step of etching the first and second hard mask material layer is performed using one of a plasma including an activated gas consisting mainly of $\text{Cl}_2 + \text{BCl}_3$ and a plasma including an activated gas consisting mainly of SF_6 .

Claim 11 (Canceled).

Claim 12 (Original): The method according to claim 11, wherein a thickness of the deposited second hard mask material layer is the same as a thickness of the first hard mask material layer.

Claim 13 (Canceled).

Claim 14 (Original): The method according to claim 5, wherein the first hard mask material layer on the second region is simultaneously removed when the second hard mask material layer on the first region is etched to expose the inter-metal dielectric.

ATTORNEY DOCKET NO.: 041501-5477

Serial No. 10/062,716

Page 6

Claim 15 (Previously Presented): The method according to claim 5, wherein the inter-metal dielectric is etched to form the via hole by using a plasma including a first activated $C_aF_b + C_xH_yF_z$ (wherein a, b, x, y, and z are integers) gas combined with a second gas including O_2 , N_2 , and Ar.

Claim 16 (Canceled).

Claim 17 (Canceled).

Claim 18 (Currently Amended): The method according to claim 1, further comprising the step of removing the ~~second hard~~ mask material remaining after forming the via hole and the trench.

Claim 19 (Original): The method according to claim 1, further comprising the step of depositing a metallic material within the via hole and the trench to form a plug and an upper metal line.